

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number  
WO 01/25387 A1

(51) International Patent Classification<sup>7</sup>: C11D 3/37

(21) International Application Number: PCT/EP00/09590

(22) International Filing Date:  
27 September 2000 (27.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
9923280.3 1 October 1999 (01.10.1999) GB

(71) Applicant (for AE, AG, AU, BB, BZ, CA, CY, GB, GD, GH, GM, IE, IL, KE, LC, LK, LS, MN, MW, NZ, SD, SG, SI, SZ, TT, TZ, UG, ZA, ZW only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4P 4BQ (GB).

(71) Applicant (for all designated States except AE, AG, AU, BB, BZ, CA, CY, GB, GD, GH, GM, IE, IL, IN, KE, LC, LK, LS, MN, MW, NZ, SD, SG, SI, SZ, TT, TZ, UG, US, ZA, ZW): UNILEVER NV [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).

(71) Applicant (for IN only): HINDUSTAN LEVER LIMITED (IN/IN); Hindustan Lever House, 165/166 Backbay Reclamation, Maharashtra, Mumbai 400 020 (IN).

(72) Inventors; and

(75) Inventors/Applicants (for US only): JARVIS, Anthony,

Nicholas [GB/GB]; Unilever Research Port Sunlight, Quarry Road East, Bebington, Wirral, Merseyside CH63 3JW (GB). PARKER, Andrew, Philip [GB/GB]; Unilever Research Port Sunlight, Quarry Road East, Bebington, Wirral, Merseyside CH63 3JW (GB). SAMS, Philip, John [GB/GB]; Unilever Research Port Sunlight, Quarry Road East, Bebington, Wirral, Merseyside CH63 3JW (GB).

(74) Agent: ELLIOTT, Peter, William; Unilever PLC, Patent Department, Colworth House, Sharnbrook, Bedford, Bedfordshire MK44 1LQ (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FABRIC CARE COMPOSITION

(57) Abstract: A fabric care composition, which is adapted for use in a domestic laundering process, comprises an anionic polymer which is capable of self cross-linking and/or of reacting with cellulosic fibres, such as cotton, and a textile compatible exhaustion agent which is also a fabric conditioner. The polymer may be a carbamoyl sulphonate terminated poly(ether)urethane or a bunte salt terminated polymer. The polymers can increase the dimensional stability of the fabric, improve its surface colour definition after washing, impart a softer handle and improve its crease recovery properties.

WO 01/25387 A1

- 1 -

### FABRIC CARE COMPOSITION

This invention relates to a fabric care composition, to a method of treating a fabric using the composition and to the  
5 use of anionic polymers contained in the composition to improve certain properties of fabrics.

The laundry process generally has several benefits for fabric, the most common being to remove dirt and stains from  
10 the fabric during the wash cycle and to soften the fabric during the rinse cycle. However, there are numerous disadvantages associated with repeated use of conventional laundry treatment compositions and/or the actual laundry process; one of these being a fairly harsh treatment of  
15 fabric in the laundry process.

Fabrics can be damaged in several ways as a result of repeated laundering and/or wear. Fabric pilling and loss of fabric surface appearance eg fuzzing, shrinkage (or  
20 expansion), loss of colour from the fabric or running of colour on the fabric (usually termed dye transfer) are some of the common problems associated with repeated laundering. These problems may occur merely from repeated hand washing as well as the more vigorous machine washing process.  
25 Furthermore, problems relating to damage of fabric over time through normal use, such as loss of shape and increased likelihood of wrinkling are also significant.

The treatment of woollen textiles with curable anionic  
30 polymers by exhaustion onto the fabric is described in GB-A-2005322. The treatment is said to confer shrink resistance

- 2 -

on wool and other keratinous materials. The process taught for the treatment involves a short liquor processing apparatus capable of agitating the goods and, although washing machines are described as being suitable for this purpose, there is no mention of domestic laundering processes. Indeed, the processes disclosed are industrial, being carried out in milling machines, for example.

Industrial treatments of a range of fabrics by padding an anionic polymer onto the fabric are disclosed in US 4191802. The polymer is directly padded on to the fabric in the process described. The process is applied industrially to fabrics containing cotton with claimed advantages of reduced shrinkage and creasing. The treatment is described as having no effect on handle of the fabric. Similar industrial treatments of wool are described in US 4520143, US 4631226, US 5595572, WO 94/19526 and US 4032565.

The industrial treatment of fabrics with thermo-reactive urethanes is taught in US 4039517. The polymers require a high temperature curing step at greater than 100°C and such high temperature curing is common for industrial processes.

The treatment of fabrics with blocked polyisocyanates is described in EP-A-0537578.

The present invention aims to alleviate some of the disadvantages associated with the laundry process. In particular, the invention seeks to attain advantages in fabric treatment as part of a conventional laundry process.

- 3 -

The advantages include increased dimensional stability of the fabric.

The present invention also seeks to improve the surface  
5 colour definition and/or the handle of the fabric in both industrial textile treatment processes and in small and large scale laundering processes.

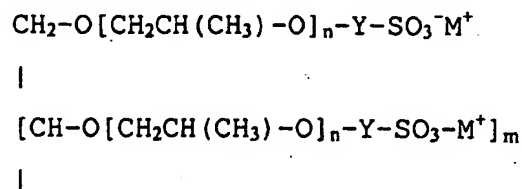
According to the present invention, there is provided a  
10 fabric care composition, adapted for use in a laundering process, comprising an anionic polymer which is capable of self cross-linking and/or reacting with cellulosic fibres and further comprising a fabric conditioning agent which acts as a textile compatible exhaustion agent for the  
15 anionic polymer.

Surprisingly, the anionic polymers can impart benefits to fabrics containing cellulosic fibres (such as cotton) in a laundering process. The benefits include increased  
20 dimensional stability and/or improved surface colour definition and/or softer handle. The dimensional stability of a fabric is generally a measure of its resistance to shrinkage. However, the term "dimensional stability", and related terms, used herein covers not only shrinkage of  
25 fabrics but also shape retention, bagginess reduction and additionally, although less preferred, crease/wrinkle resistance in fabrics.

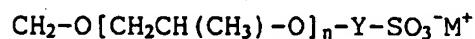
- 4 -

Preferably, the anionic polymer is selected from carbamoyl sulphonate terminated poly(ether)urethane resins, bunte salt terminated polymers and mixtures thereof. Suitable polymers include those having the formula (I):

5



10



(I)

wherein:

15 Y is a divalent radical selected from  $\text{-CH}_2\text{-CH}(\text{OH})\text{-CH}_2\text{-S-}$  and  $\text{-CO-NH-(CH}_2)_p\text{-NH-CO-}$ ;

m is an integer from 0 to 4;

n is an integer from 5 to 20;

M is an alkali metal; and

20 p is an integer from 2 to 12.

Preferably, m is equal to 1.

Conveniently, Y is  $\text{-CO-NH-(CH}_2)_p\text{-NH-CO-}$

25 and, preferably, p is from 4 to 8, such as about 6.

It is also preferred that n is 10 to 15, such as about 13, for example.

30 M is advantageously sodium or potassium, more preferably sodium.

- 5 -

Polymers in which Y is  $-\text{CO}-\text{NH}-(\text{CH}_2)_p-\text{NH}-\text{CO}-$  are commercially available under the Trade Mark SYNTHAPPRET BAP (Bayer).

Polymers in which Y is  $-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-\text{S}-$  are available under  
5 the Trade Mark NOPCOLAN SHR3 (Henkel).

Conditioning/exhaustion agents which are suitable for use in the compositions of the invention include water soluble or water dispersible compounds comprising one or more cationic  
10 groups. The cationic groups are preferably quaternary ammonium cations.

Preferred materials include HEQ (1,2-bis-[hardened tallowyloxy]-3-trimethylammonium propane chloride), for  
15 example.

In the present invention, quaternary ammonium cations such as HEQ have the dual function of acting as both exhaustion agents and as fabric conditioning/softening compounds, as  
20 described hereinafter.

Optionally, other cationic species, which do not act as fabric softening compounds, such as other predominantly organic cations and simple metal cations (eg magnesium), for  
25 example, may also be used as additional exhaustion agents in the fabric care compositions of the invention. The compositions of the invention may contain one textile compatible exhaustion agent or a mixture of two or more textile compatible exhaustion agents.

30

- 6 -

Softening and/or conditioning compounds which are not exhaustion agents are optional further components of the compositions of the invention.

- 5 The softening and/or conditioning compounds may be water insoluble quaternary ammonium compounds. The compounds may be present in amounts of up to 8% by weight (based on the total amount of the composition) in which case the compositions are considered dilute, or at levels from 8% to  
10 about 50% by weight, in which case the compositions are considered concentrates.

Compositions suitable for delivery during the rinse cycle may also be delivered to the fabric in the tumble dryer if  
15 used in a suitable form. Thus, another product form is a composition (for example, a paste) suitable for coating onto, and delivery from, a substrate eg a flexible sheet or sponge or a suitable dispenser (such as a container having apertures therein, for example) during a tumble dryer cycle.

- 20 Suitable cationic fabric softening compounds are substantially water-insoluble quaternary ammonium materials comprising a single alkyl or alkenyl long chain having an average chain length greater than or equal to C<sub>20</sub> or, more  
25 preferably, compounds comprising a polar head group and two alkyl or alkenyl chains having an average chain length greater than or equal to C<sub>14</sub>. Preferably the fabric softening compounds have two long chain alkyl or alkenyl chains each having an average chain length greater than or  
30 equal to C<sub>16</sub>. Most preferably at least 50% of the long chain alkyl or alkenyl groups have a chain length of C<sub>18</sub> or above.

- 7 -

It is preferred if the long chain alkyl or alkenyl groups of the fabric softening compound are predominantly linear.

Quaternary ammonium compounds having two long-chain  
5 aliphatic groups, for example distearyldimethyl ammonium chloride and di (hardened tallow alkyl) dimethyl ammonium chloride, are widely used in commercially available rinse conditioner compositions. Other examples of these cationic  
10 compounds are to be found in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch. Any of the conventional types of such compounds may be used in the compositions of the present invention.

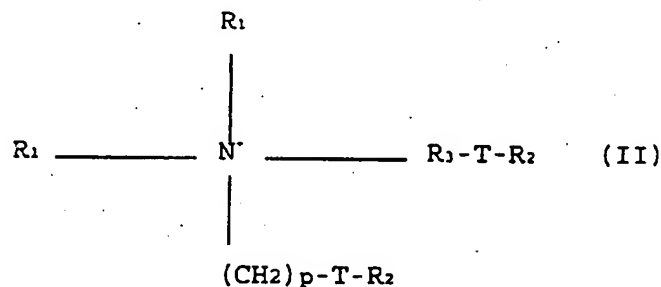
The fabric softening compounds are preferably compounds that  
15 provide excellent softening, and are characterised by a chain melting  $L\beta$  to  $L\alpha$  transition temperature greater than  $25^{\circ}\text{C}$ , preferably greater than  $35^{\circ}\text{C}$ , most preferably greater than  $45^{\circ}\text{C}$ . This  $L\beta$  to  $L\alpha$  transition can be measured by DSC  
20 as defined in "Handbook of Lipid Bilayers", D Marsh, CRC Press, Boca Raton, Florida, 1990 (pages 137 and 337). Substantially water-insoluble fabric softening compounds are defined as fabric softening compounds having a solubility of less than  $1 \times 10^{-3}$  wt % in demineralised water at  $20^{\circ}\text{C}$ . Preferably the fabric softening compounds have a solubility  
25 of less than  $1 \times 10^{-4}$  wt %, more preferably less than  $1 \times 10^{-8}$  to  $1 \times 10^{-6}$  wt %.

Especially preferred are cationic fabric softening compounds that are water-insoluble quaternary ammonium materials  
30 having two  $\text{C}_{12-22}$  alkyl or alkenyl groups connected to the

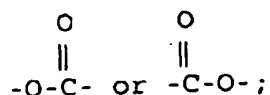


- 8 -

molecule via at least one ester link, preferably two ester links. An especially preferred ester-linked quaternary ammonium material can be represented by the formula II: wherein each  $R_1$  group is independently selected from  $C_{1-4}$



- 5 alkyl or hydroxyalkyl groups or  $C_{2-4}$  alkenyl groups; each  $R_2$  group is independently selected from  $C_{8-28}$  alkyl or alkenyl groups; and wherein  $-R_3-$  is a linear or branched alkylene group of 1 to 5 carbon atoms, T is

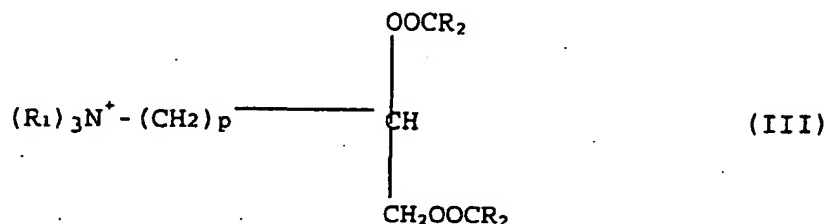


- 10 and p is 0 or is an integer from 1 to 5.

Di (tallowoyloxyethyl) dimethyl ammonium chloride and/or its hardened tallow analogue is especially preferred of the compounds of formula (II).

15

A second preferred type of quaternary ammonium material can be represented by the formula (III):



- 9 -

wherein  $R_1$ ,  $p$  and  $R_2$  are as defined above.

It is advantageous if the quaternary ammonium material is  
5 biologically biodegradable.

Preferred materials of this class such as 1,2-bis (hardened  
tallowoyloxy) -3-trimethylammonium propane chloride and  
their methods of preparation are, for example, described in  
10 US 4 137 180 (Lever Brothers Co). Preferably these  
materials comprise small amounts of the corresponding  
monoester as described in US 4 137 180, for example, 1-  
hardened tallowoyloxy-2-hydroxy-3-trimethylammonium propane  
chloride.

15 Other useful cationic softening agents are alkyl pyridinium  
salts and substituted imidazoline species. Also useful are  
primary, secondary and tertiary amines and the condensation  
products of fatty acids with alkylpolyamines.

20 The compositions may alternatively or additionally contain  
water-soluble cationic fabric softeners, as described in GB  
2 039 556B (Unilever).

25 The compositions may comprise a cationic fabric softening  
compound and an oil, for example as disclosed in EP-A-  
0829531.

The compositions may alternatively or additionally contain  
30 nonionic fabric softening agents such as lanolin and  
derivatives thereof.

- 10 -

Lecithins are also suitable softening compounds.

Nonionic softeners include L $\beta$  phase forming sugar esters  
5 (as described in M Hato et al Langmuir 12, 1659, 1966,  
(1996)) and related materials such as glycerol monostearate  
or sorbitan esters. Often these materials are used in  
conjunction with cationic materials to assist deposition  
(see, for example, GB 2 202 244 ). Silicones are used in a  
10 similar way as a co-softener with a cationic softener in  
rinse treatments (see, for example, GB 1 549 180).

Other suitable softeners include liquid or soft solid sugar  
esters of the type described in WO 98/16538, for example.

15

The compositions may also suitably contain a nonionic  
stabilising agent. Suitable nonionic stabilising agents are  
linear C<sub>8</sub> to C<sub>22</sub> alcohols alkoxyated with 10 to 20 moles of  
alkylene oxide, C<sub>10</sub> to C<sub>20</sub> alcohols, or mixtures thereof.

20 Advantageously the nonionic stabilising agent is a linear C<sub>8</sub>  
to C<sub>22</sub> alcohol alkoxyated with 10 to 20 moles of alkylene  
oxide. Preferably, the level of nonionic stabiliser is  
within the range from 0.1 to 10% by weight, more preferably  
from 0.5 to 5% by weight, most preferably from 1 to 4% by  
25 weight. The mole ratio of the quaternary ammonium compound  
and/or other cationic softening agent to the nonionic  
stabilising agent is suitably within the range from 40:1 to  
about 1:1, preferably within the range from 18:1 to about  
3:1.

30

- 11 -

- The composition can also contain fatty acids, for example  $C_8$  to  $C_{24}$  alkyl or alkenyl monocarboxylic acids or polymers thereof. Preferably saturated fatty acids are used, in particular hardened tallow  $C_{16}$  to  $C_{18}$  fatty acids. Preferably
- 5 the fatty acid is non-saponified, more preferably the fatty acid is free, for example oleic acid, lauric acid or tallow fatty acid. The level of fatty acid material is preferably more than 0.1% by weight, more preferably more than 0.2% by weight. Concentrated compositions may comprise from 0.5 to
- 10 20% by weight of fatty acid, more preferably 1% to 10% by weight. The weight ratio of quaternary ammonium material or other cationic softening agent to fatty acid material is preferably from 10:1 to 1:10.
- 15 The fabric conditioning compositions may include silicones, such as predominantly linear polydialkylsiloxanes, eg polydimethylsiloxanes or aminosilicones containing amine-functionalised side chains; soil release polymers such as block copolymers of polyethylene oxide and terephthalate;
- 20 amphoteric surfactants; smectite type inorganic clays; zwitterionic quaternary ammonium compounds; and nonionic surfactants. Preferably, the silicone component is a dimethylpolysiloxane with aminoalkyl groups.
- 25 The fabric conditioning compositions may also include an agent which produces a pearlescent appearance, eg an organic pearlising compound such as ethylene glycol distearate, or inorganic pearlising pigments such as microfine mica or titanium dioxide ( $TiO_2$ ) coated mica.

- 12 -

The fabric conditioning compositions may be in the form of emulsions or emulsion precursors thereof.

Other optional ingredients include emulsifiers, electrolytes  
5 (for example, sodium chloride or calcium chloride)  
preferably in the range from 0.01 to 5% by weight, pH  
buffering agents, and perfumes (preferably from 0.1 to 5% by  
weight).

10 Further optional ingredients include non-aqueous solvents,  
perfume carriers, fluorescers, colourants, hydrotropes,  
antifoaming agents, antiredeposition agents, enzymes,  
optical brightening agents, opacifiers, anti-shrinking  
agents, anti-wrinkle agents, anti-spotting agents, dye  
15 transfer inhibitors, germicides, fungicides, anti-oxidants,  
UV absorbers (sunscreens), heavy metal sequestrants,  
chlorine scavengers, dye fixatives, anti-corrosion agents,  
drape imparting agents, antistatic agents and ironing aids.  
This list is not intended to be exhaustive.

20

The amount of the anionic polymer in the composition of the  
invention preferably ranges from 0.01 to 35% by weight, more  
preferably 0.01 to 10%, most preferably 0.05 to 5%. The  
amount of anionic polymer deposited on the fabric in the  
25 invention preferably ranges from 0.0005% to 5% by weight of  
resin based on weight of fabric (owf), more preferably  
0.001% to 2% owf.

Certain fabric care compositions of the invention in which  
30 the exhaustion agent is a quaternary ammonium compound have  
surprisingly good stability. Aqueous compositions

- 13 -

containing an anionic polymer and a cationic exhaustion agent of this type could reasonably have been expected to be unstable and to form a precipitate or gel. Furthermore, compositions containing the quaternary ammonium compound and  
5 the anionic polymer can have a pearlescent appearance which may be desirable in certain product applications

In another embodiment, the present invention provides a method of treating a fabric, as part of a laundering  
10 process, which comprises applying to the fabric a composition of the invention. Preferably, the composition is applied to the fabric during the rinse cycle of a conventional laundering process, more preferably after application of a detergent composition to the fabric. The  
15 laundering process may be a domestic laundering process.

In a further embodiment, the invention relates to the use of an anionic polymer which is capable of self cross-linking and/or of reacting with cellulosic fibres in a laundering  
20 process to increase the dimensional stability of a fabric which comprises cellulosic fibres.

The invention also relates to the use of an anionic polymer which is capable of self cross-linking and/or of reacting  
25 with cellulosic fibres to improve the surface colour definition of a fabric after washing, wherein the fabric comprises cellulosic fibres.

Further provided by the invention is the use of an anionic  
30 polymer which is capable of self cross-linking and/or of

- 14 -

reacting with cellulosic fibres to impart a softer handle to a fabric which comprises cellulosic fibres.

5 Additionally, the invention provides the use of an anionic polymer which is capable of cross-linking and/or of reacting with cellulosic fibres in a laundering process to improve the crease recovery properties of a fabric which comprises cellulosic fibres.

10 In the latter four embodiments of the invention, the anionic polymer is preferably of formula (I), as defined above. Preferably, in formula (I),  $m$  is equal to 1. Conveniently,  $Y$  is  $-\text{CH}-\text{NH}-(\text{CH}_2)_p-\text{NH}-\text{CO}-$  and, preferably,  $p$  is from 4 to 8, such as about 6. It is also preferred that  $n$  is 10 to 15,  
15 such as about 13 for example.  $M$  is advantageously sodium or potassium, more preferably sodium.

The anionic polymer in the latter four embodiments of the invention may be formulated in any suitable form for fabric  
20 treatment. Where the anionic polymer is for use in a laundering system, it may be in the form of a composition for use in any stage of the laundering process. For example, the composition may be a pre-wash treatment, a main wash detergent composition, a rinse applied composition  
25 (such as a fabric conditioning composition or a rinse adjunct) or it may be formulated for application to a fabric before, during or after tumble drying such as by delivery from a suitable dispenser or from a flexible sheet or it may be formulated as an ironing aid. If the composition is a  
30 rinse applied composition, it may be a fabric care composition of the invention.

- 15 -

Although applicable to fabrics containing any type of cellulosic fibres, the present invention provides particular advantages for fabrics which comprise cotton or regenerated  
5 cellulose such as viscose, especially cotton. The fabric may be in the form of a garment. The fabrics may contain 50% to 100% cotton, such as 75% to 100% cotton, for example. If the fabrics do not contain 100% cotton, the balance may be made up of fibres conventionally used in garments such as  
10 of polyester and polyamide, for example.

The invention will be illustrated by the following non-limiting examples.

15 **Examples**

Example 1

A composition of the invention (Example 1) was prepared by  
20 adding 2% by weight SYNTHAPPRET BAP (trade mark) anionic polymer (Bayer) to 55ml of a standard fabric conditioner composition (Comfort®, Unilever, UK).

The composition of the invention was applied to a 1.25 kg  
25 load containing printed woven cotton fabric in the final rinse of a fully loaded automatic washing machine wash cycle (40°C cotton wash in a Miele Novotronic W820 (trade mark) front loading washing machine).

30 Red and black coloured regions of the cotton fabric were assessed for the change in colour after three washing



- 16 -

cycles, relative to new fabric ie, as purchased and before washing.

Control tests were carried out using: (a) no rinse  
 5 treatment; (b) conventional Comfort® fabric conditioner only; and (c) anionic polymer SYNTHAPPRET BAP (trade mark) only.

The overall results (an average of the results for 4  
 10 samples) are as follows:

(i) Red regions

| Treatment                                       | -E*  |
|---|------|
| (a) None  | 8.59 |
| (b) Conventional conditioner                    | 8.77 |
| (c) Anionic polymer only                        | 8.37 |
| (d) Composition of the invention<br>(Example 1) | 8.37 |

\*Change in colour relative to new fabric measured using a  
 15 Spectraflash (trade mark) photometer

(ii) Black regions

| Treatment                                       | -E*  |
|---|------|
| (a) None  | 6.99 |
| (b) Conventional conditioner                    | 7.94 |
| (c) Anionic polymer only                        | 7.28 |
| (d) Composition of the invention<br>(Example 1) | 6.33 |

\*Change in colour measured as for (i)

- 17 -

Thus, an improvement in the colour of the fabric after washing was observed with the composition of the invention relative to conventional conditioner and anionic polymer used alone. Furthermore, the fabric treated with the composition of the invention was observed to have as good a handle as fabric treated with the conventional conditioner.

#### Example 2

10

The product of Example 2 was prepared by mixing 190 g of Comfort Concentrate (trade mark) and 20 g of SYNTHAPPRET BAP (trade mark). This gives a composition having a product activity of 17.9% comprising 13.1% Comfort (trade mark) and 4.76% SYNTHAPPRET BAP (trade mark).

15

The product was applied five times to printed woven cotton fabric at a level of 0.2% active per wash during the rinse cycle of a conventional domestic laundry process (40°C cotton wash, Zanussi (trade mark) washing machine). After each wash the load was tumble-dried (Miele Novotronic (trade mark) tumble dryer).

20

After completion of the fifth wash, the colour of the print was measured on a spectroflash (trade mark) spectrometer.

25

The colour measurements were:

Black regions:

30

- 18 -

|                 | $\Delta L^{**}$ | Standard Deviation |
|-----------------|-----------------|--------------------|
| Untreated       | 9.17            | 1.30               |
| Comfort         | 10.11           | 0.46               |
| SYNTHAPPRET BAP | 8.31            | 0.61               |
| 5 Example 2     | 6.02            | 0.75               |

\*\*Change in lightness relative to new fabric;  $\Delta E$  and  $\Delta L$  are almost identical for the black regions.

- 10 Again, the fabric treated with the composition of the invention had better surface colour definition, and overall appearance, than fabric treated with the conventional conditioner or the anionic polymer alone. The fabric treated with the composition of the invention was observed
- 15 to have at least as good a handle as fabric treated with the conventional conditioner in spite of the fact that less of the active component of the fabric conditioning composition is present in the composition of the invention.

20

- 19 -

CLAIMS

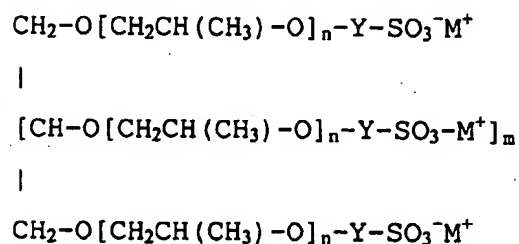
1. Fabric care composition, adapted for use in a  
laundering process, comprising:
- 5 a) an anionic polymer which is capable of self cross-  
linking and/or of reacting with cellulosic fibres and  
further comprising  
b) a fabric conditioning agent which acts as a textile  
compatible exhaustion agent for the anionic polymer.

10

2. Composition as claimed in Claim 1, wherein the polymer  
is selected from carbamoyl sulphonate terminated  
poly(ether)urethane resins, bunte salt terminated  
polymers and mixtures thereof.

15

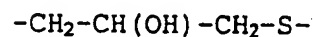
3. Composition as claimed in Claim 2, wherein the polymer  
is of the formula (I):



20

25

wherein: Y is a divalent radical selected from



and  $-\text{CO-NH-}(\text{CH}_2)_p\text{-NH-CO-}$

30

- 20 -

m is an integer from 0 to 4;

n is an integer from 5 to 20;

M is an alkali metal; and

p is an integer from 2 to 12

5

4. Composition as claimed in Claim 3, wherein m is 1, Y is  
-CO-NH-(CH<sub>2</sub>)<sub>6</sub>-NH-CO- and M is sodium.

5. Composition as claimed in any one of Claims 1 to 4,  
10 wherein the exhaustion agent is a quaternary ammonium  
compound.

6. Composition as claimed in Claim 5, wherein the  
quaternary ammonium compound is HEQ.

15

7. Composition as claimed in any one of Claims 1 to 6,  
which is a fabric softening and/or conditioning  
composition.

20 8. Composition is claimed in any one of Claims 1 to 7  
which further comprises a perfume.

9. Method of treating a fabric, as part of a laundering  
process, which comprises applying to the fabric a  
25 composition according to any one of Claims 1 to 8.

10. Method as claimed in Claim 9, wherein the fabric  
comprises cellulosic fibres.

- 21 -

11. Method as claimed in Claim 9 or Claim 10, wherein the composition is applied to the fabric during a rinse cycle.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/09590

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C11D3/37

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C11D C08G D06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                                 | Relevant to claim No. |
|------------|--|-----------------------|
| A          | EP 0 335 404 A (LION CORP)<br>4 October 1989 (1989-10-04)<br>abstract  | 1,5-11                |
| A          | GB 2 005 322 A (IWS NOMINEE CO LTD)<br>19 April 1979 (1979-04-19)<br>cited in the application<br>claims 1,3,4,9,10 | 1-4,9                 |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

16 January 2001

Date of mailing of the international search report

23/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl  
Fax (+31-70) 340-3016

Authorized officer

Saunders, T

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/09590

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|---------------------|----------------------------|---------------------|
| EP 0335404 A                              | 04-10-1989          | JP 1250473 A               | 05-10-1989          |
|   |                     | JP 1580169 C               | 11-10-1990          |
|   |                     | JP 2004709 B               | 30-01-1990          |
| GB 2005322 A                              | 19-04-1979          | AU 520469 B                | 04-02-1982          |
|   |                     | AU 3868078 A               | 07-02-1980          |
|   |                     | DK 344878 A,B,             | 05-02-1979          |
|   |                     | ES 472340 A                | 16-11-1979          |
|   |                     | FI 782389 A,B,             | 05-02-1979          |
|   |                     | GR 64927 A                 | 09-06-1980          |
|   |                     | IT 1098008 B               | 31-08-1985          |
|   |                     | NZ 188034 A                | 26-08-1980          |
|   |                     | PT 68354 A                 | 01-08-1978          |
|   |                     | US 4225312 A               | 30-09-1980          |
|   |                     | ZA 7804438 A               | 25-07-1979          |